

WHAT IS CLAIMED IS:

1       1. An antigen-based heteropolymer (AHP) complex comprising  
2       a monoclonal antibody specific for binding to complement receptor  
3       (CR1) site on a primate erythrocyte, wherein said monoclonal  
4       antibody is crosslinked to an antigen specific for a target  
5       pathogenic antibody or autoantibody.

1       2. The AHP of Claim 1, wherein the monoclonal antibodies  
2       are selected from the group consisting of 1B4, HB8592, and 7G9.

1       3. The AHP of Claim 1, wherein the target antibody or  
2       autoantibody is selected from the group consisting of antibodies  
3       or autoantibodies to the following antigens: factor VIII, muscle  
4       acetylcholine receptor, cardiolipin, platelet associated  
5       proteins, antigens associated with Sjogren's Syndrome, double  
6       stranded deoxyribonucleic acid (dsDNA), and single stranded DNA  
7       (ssDNA).

1       4. The AHP of Claim 1, wherein said antigen is selected  
2       from the group consisting of factor VIII, muscle acetylcholine  
3       receptor, cardiolipin, platelet associated proteins, antigens  
4       associated with Sjogren's Syndrome, double stranded  
5       deoxyribonucleic acid (dsDNA), and single stranded DNA (ssDNA).

1       5. An AHP cocktail, comprising at least two AHP's wherein  
2       said AHP comprises a monoclonal antibody specific for binding to  
3       complement receptor (CR1) site on a primate erythrocyte, and

4 wherein said monoclonal antibody is crosslinked to an antigen  
5 specific for a target pathogenic antibody or autoantibody.

1         6. A method for treating an autoimmune disease comprising  
2 the steps of:

3             1) administering to a human or non-human primate a  
4 clinically effective amount of an AHP, said AHP comprising a  
5 monoclonal antibody specific for complement receptor (CR1) site  
6 on a primate erythrocyte, and wherein said monoclonal antibody  
7 is crosslinked to an antigen which is specific for a target  
8 pathogenic antibody or autoantibody;

9             2) allowing said AHP to bind to at least one  
10 competing CR1 site and to said pathogenic antibody or  
11 autoantibody; and

12             3) permitting said bound AHP to be cleared from  
13 circulation of said human or non-human primate.

1         7. The method of Claim 6, wherein the monoclonal antibody  
2 is selected from the group consisting of 1B4, HB8592, and 7G9.

1         8. The AHP of Claim 6, wherein the target antibody or  
2 autoantibody is selected from the group consisting of antibodies  
3 or autoantibodies to the following antigens: factor VIII, muscle  
4 acetylcholine receptor, cardiolipin, platelet associated  
5 proteins, antigens associated with Sjogren's Syndrome, double  
6 stranded deoxyribonucleic acid (dsDNA), and single stranded DNA  
7 (ssDNA).

1       9. The AHP of Claim 6, wherein said antigen is selected  
2 from the group consisting of factor VIII, muscle acetylcholine  
3 receptor, cardiolipin, platelet associated proteins, antigens  
4 associated with Sjogren's Syndrome, double stranded  
5 deoxyribonucleic acid (dsDNA), and single stranded DNA (ssDNA).

1       10. The method of Claim 6, wherein the AHP is administered  
2 intravenously to a human or non-human primate in a clinically  
3 effective amount.

1       11. The method of Claim 10, wherein said AHP is  
2 administered intravenously to a human in a clinically effective  
3 amount of 1-10 mg.

1       12. The method of Claim 6, wherein said administration of  
2 said clinically effective amount of AHP is repeated until the  
3 pathogenic antibody or autoantibody is completely cleared from  
4 circulation of said human or non-human primate.

1       13. The method of Claim 6, wherein said target pathogenic  
2 antibody or autoantibody is cleared from a circulatory system of  
3 a primate and said primate erythrocyte is recirculated through  
4 the circulatory system.

1       14. A method for treating an autoimmune disease comprising  
2 the steps of:

3           1) administering to a human or non-human primate an  
4 effective amount of an AHP cocktail comprising at least two

5 AHP's, wherein each AHP comprises a monoclonal antibody specific  
6 for complement receptor (CR1) site on a primate erythrocyte, and  
7 wherein said monoclonal antibody is crosslinked to an antigen  
8 which is specific for a target pathogenic antibody or  
9 autoantibody;

10           2) allowing said AHP cocktail to bind to at least one  
11 competing CR1 site and to said pathogenic antibody or  
12 autoantibody; and

13           3) permitting said bound AHP cocktail to be cleared  
14 from circulation of said human or non-human primate.

15. A method for treating an autoimmune disease comprising  
the steps of:

1           1) franking human or non-human primate erythrocytes  
2 with an AHP, said AHP comprising a monoclonal antibody specific  
3 for complement receptor (CR1) site on a primate erythrocyte, and  
4 wherein said monoclonal antibody is crosslinked to an antigen  
5 which is specific for a target pathogenic antibody or  
6 autoantibody;

7           2) administering to a human or non-human primate a  
8 clinically effective amount of the AHP-franked erythrocytes;

9           3) allowing said franked AHP to bind to said  
10 pathogenic antibody or autoantibody; and

11           4) permitting said bound AHP to be cleared from  
12 circulation of said human or non-human primate.